

BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

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Better Planning Can Reduce Size Of Wastewater Treatment Facilities, Saving Millions In Construction Costs

Well-planned wastewater treatment plants are crucial to the success of the Nation's multibillion dollar effort to clean up thousands of miles of contaminated rivers, lakes, streams, and ocean shorelines. GAO found that millions of dollars in Federal construction grant funds could be saved by applying current regulations--which restrict the size of plants and ultimately the cost to construct them--to treatment plants not yet under construction that were planned under old regulations.

GAO recommends that the Congress direct the Administrator of the Environmental Protection Agency to modify the Agency's current policy prohibiting retroactive application of program regulations to projects not yet under construction.



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COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

BETTER PLANNING CAN REDUCE
SIZE OF WASTEWATER TREATMENT
FACILITIES, SAVING MILLIONS
IN CONSTRUCTION COSTS

D I G E S T

Millions of dollars in Federal, State, and local construction funds can be saved by applying the Environmental Protection Agency's (EPA's) 1978 facility planning regulations to wastewater treatment plant projects developed under pre-1978 regulations but not yet under construction. (See p. 8.)

Wastewater treatment plants are considered to be the frontline of the Nation's battle to eliminate pollution and restore water quality throughout the country. Billions of Federal dollars plus several billion dollars in State and local funds have been and are yet to be spent on constructing treatment plants to meet the Nation's cleanup goals. (See p. 1.)

The facility plans on which treatment plants are designed and constructed are crucially important to the success of this multibillion dollar effort. The theory behind facility planning is straightforward--determine the sources and amount of wastewater a plant is to treat now and in the future, select the process required to treat the waste, and establish the size of plant necessary to provide the required level of treatment. But implementing the theory is complex. (See p. 20.)

In addressing one of the key components--treatment plant size--EPA issued regulations, effective October 1, 1978, limiting the size of plant eligible for Federal funding by restricting the amount of future domestic and industrial flows the planned facility would treat. However, the regulations applied only to projects for which planning grants were approved after September 30, 1978. (See p. 8.)

GAO estimates that if these regulations were applied to the 13 facility plans it reviewed, all of which had their planning grants approved before October 1, 1978, about \$30 million in

Federal grant program funds could be saved when and if these projects move to the construction phase. Within the three EPA regions included in GAO's review, a total of 1,695 facility planning grant awards were made before October 1, 1978. Of these, 1,202, or 71 percent, have not yet advanced to the construction phase. (See p. 8.)

GAO made this review to evaluate the effectiveness of the facility planning process for constructing treatment plants and to determine whether changed conditions, such as increases or decreases in population projections or industrial flow for the proposed service area, were recognized and incorporated into the facility plans before the plant was designed or before construction started. (See p. 5.)

CURRENT REGULATIONS LIMIT ENGINEERING
JUDGMENT IN CALCULATING DOMESTIC AND
INDUSTRIAL FLOW ALLOWANCES

Pre-1978 regulations gave the municipalities and their consulting engineers wide latitude in projecting future domestic and industrial flow. For facility planning grants approved after September 30, 1978, EPA regulations eliminated some of the subjectivity involved in calculating future flow.

For example, the amount of domestic flow to be treated by a wastewater plant is generally determined on the basis of population to be served. Before the 1978 regulations were in effect, no criteria or guidance existed to indicate which source of data--city, county, State, etc.--should be used to project population growth figures for the planning area. GAO found that consulting engineers used several sources, with widely differing yet acceptable results, to project future population. (See p. 8.)

Under the 1978 regulations, EPA stipulated that State population projections would be the sole basis for estimating future population levels to be served by the proposed treatment system. (See p. 8.)

EFFECT OF CURRENT REGULATIONS ON PLANT SIZE AND FEDERAL GRANT FUNDS

Applying the 1978 regulations to projects not yet under construction would change the projects significantly. Eleven of the 13 proposed plants in GAO's review would be smaller--ranging from 4 to 49 percent smaller than the total plant size recommended in the facility plans. (The remaining two plants would be larger by 1 and 3 percent, respectively.) For example, applying the current regulations to a proposed treatment plant in Claremont, New Hampshire, would reduce the plant by 32 percent and could save \$3 million in Federal construction grant funds. (See p. 14.)

1981 AMENDMENTS SIGNIFICANTLY REDUCE FEDERAL ROLE IN PLANT CONSTRUCTION

The Municipal Wastewater Treatment Construction Grant Amendments of 1981, enacted on December 29, 1981, provide that, effective October 1, 1984, no Federal grant will be made to construct that portion of any treatment works providing reserve capacity in excess of existing needs as of the date of grant approval. In addition, the amendments reduced the Federal participation level from 75 percent to 55 percent of the construction costs. (See p. 15.)

Significant Federal savings can be realized between now and October 1984 by applying the 1978 regulations to each project on a case-by-case basis. GAO believes that EPA could include, as part of its review to prevent segmenting of proposed construction projects, a quick test using the 1978 regulations' criteria for domestic and industrial flow allowances to ascertain the extent of potential savings. (See p. 16.)

MANY FACETS OF FACILITY PLANNING ARE NOT COVERED BY GUIDANCE OR REGULATION

Many areas of facility planning that affect treatment plant size are still not covered by either guidance or regulation. As a result, engineering judgment, which GAO found to vary considerably from project to project, becomes the deciding factor in determining

plant size and ultimately total project cost. For example, in Bristol, Rhode Island, a second engineer, using the same data as the first engineer retained by the community, recommended a larger plant, resulting in an estimated net cost increase of \$1.2 million. (See p. 20.)

GAO believes that additional criteria are needed not only to assist the engineers and the community in arriving at a properly sized treatment plant but also to provide EPA and State facility plan reviewers a basis on which to evaluate the adequacy of the plan and its recommended treatment system. Neither EPA nor the States typically verify key information contained in the plan; conduct their own tests on flow amounts--domestic, industrial, and infiltration/inflow--subject to treatment; or perform any of the analyses generally associated with plan development. (See p. 29.)

AGENCY COMMENTS AND GAO EVALUATION

GAO's draft report recommended that the Administrator, EPA, amend the 1978 facility planning regulations for determining plant size to apply to all projects progressing to either the design or construction phase where, in the Administrator's judgment, applying the 1978 criteria would result in significant Federal savings.

EPA did not object to the concept of applying regulations retroactively but pointed out that the Agency was restricted from such action by a provision of the 1981 Appropriation Act. EPA further stated that if the Congress directs EPA to modify its current policy prohibiting the retroactive application of program regulations, EPA would consider the factors listed in the GAO report, including the effect of inflation on construction costs during reanalysis and redesign. (See p. 17.)

EPA also stated that it concurs with the GAO concept of developing standards for each critical factor used in establishing existing as well as future industrial and infiltration/inflow amounts to be treated by a wastewater plant. However, EPA disagrees with establishing similar standards as they relate to discharge ratios for existing and future domestic waste flows. (See p. 29.)

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GAO continues to believe that specific standards to measure all critical factors are essential to ensure proper sizing of treatment plants. Without standards, the situation identified by GAO--widely varying interpretation of existing guidance without justification--will continue, resulting in potential over- or undersizing of proposed treatment facilities.

RECOMMENDATION TO THE CONGRESS

GAO recommends that the Congress direct the Administrator, EPA, to modify the Agency's current policy prohibiting retroactive application of program regulations. (See p. 18.)

RECOMMENDATION TO THE ADMINISTRATOR, EPA

GAO recommends that the Administrator, EPA, with the cooperation of the engineering community, develop standards for each critical factor used in establishing existing and future domestic, industrial, and infiltration/inflow amounts to be treated by a wastewater plant. (See p. 29.)

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APPENDIX

- I** Letter dated June 1, 1982, from the
Acting Associate Administrator for
Policy and Resource Management,
Environmental Protection Agency

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ABBREVIATIONS

EPA	Environmental Protection Agency
GAO	General Accounting Office
mgd	million gallons per day
NPDES	National Pollutant Discharge Elimination System